

CLAIMS

1. A release sheet providing a desired surface effect for use in replicative casting of curable systems comprising:
 - a) a substrate;
 - 5 b) an acrylic functional coating layer provided on at least one surface of the substrate, containing said surface effect; and
 - c) a silicone release coating layer provided on the acrylic functional coating layer, such that the continuity of said release layer is maintained, acceptable release of the cast film from said silicone release coating is achieved and alteration of said underlying desired surface effect is
10 minimized.
2. The release sheet of claim 1 wherein the acrylic functional coating layer comprises an acrylated oligomer and a monomer selected from a group consisting of monofunctional acrylates, multifunctional acrylates and mixtures thereof.
3. The release sheet of claim 2 wherein the acrylic functional coating layer further comprises 2% or
15 less by total weight of the coating of a siloxane release agent.
4. The release sheet of claim 2 wherein the acrylic functional coating comprises 2% or less by total weight of the coating of an aminofunctional siloxane release agent.
5. The release sheet of claim 2 wherein the acrylic functional coating comprises 1% or less by total weight of the coating of an aminofunctional siloxane release agent.
- 20 6. The release sheet of claim 2 wherein the acrylic functional coating comprises 0.25% or less by total weight of the coating of an aminofunctional siloxane release agent.
7. The release sheet of claim 2 wherein the acrylic functional coating is substantially free of an aminofunctional siloxane release agent.

8. The release sheet of claim 2 wherein the silicone release coating layer comprises 90 parts or less polyvinyl alcohol, 100 parts or less of a complex reactive organofunctional siloxane release modifier, 90 parts or less of a reactive organofunctional siloxane emulsion coating, 10 to 20 parts of a catalyst selected from a group consisting of platinum complex and tin complex, and 2 to 12 parts of a nonionic surface wetting agent containing polyoxyethylene groups.
9. The release sheet of claim 8 wherein the catalyst is a platinum complex catalyst.
10. The release sheet of claim 8 wherein the nonionic surface wetting agent containing polyoxyethylene groups is a silicone glycol copolymer wetting agent.
11. The release sheet of claim 1 wherein the silicone release coating layer comprises 70 parts or less polyvinyl alcohol, 50 to 90 parts of a complex reactive organofunctional siloxane release modifier, 50 parts or less of a reactive organofunctional siloxane emulsion coating, and 4 to 8 parts of a silicone glycol copolymer wetting agent.
12. A release sheet providing a desired surface effect for use in replicative casting of curable systems comprising:
- a) a substrate;
 - b) an acrylic functional coating layer provided on at least one surface of the substrate, containing said surface effect, comprising 10 to 50 parts of an acrylated oligomer, 20 to 60 parts of a monofunctional monomer, 20 to 60 parts of a multifunctional monomer, selected from a group consisting of TMPTA, TPGDA, and mixtures thereof, and an aminofunctional siloxane release agent at 2% or less by total weight of the coating; and
 - c) a silicone release coating layer provided on the acrylic functional coating layer, such that the continuity of said release layer is maintained, acceptable release of the cast film from said silicone release coating is achieved and alteration of said underlying desired surface effect is minimized.

13. The release sheet of claim 12 wherein the acrylic functional coating comprises 1% or less by total weight of the coating of an aminofunctional siloxane release agent.
14. The release sheet of claim 12 wherein the acrylic functional coating comprises 0.25% or less by total weight of the coating of an aminofunctional siloxane release agent.
- 5 15. The release sheet of claim 12 wherein the acrylic functional coating is substantially free of an aminofunctional siloxane release agent.
16. The release sheet of claim 12 wherein the silicone release coating layer comprises 90 parts or less polyvinyl alcohol, 100 parts or less of a complex reactive organofunctional siloxane release modifier, 90 parts or less of a reactive organofunctional siloxane emulsion coating, 10 to 20 parts
10 of a catalyst selected from a group consisting of platinum complex and tin complex, and 2 to 12 parts of a nonionic surface wetting agent containing polyoxyethylene groups.
17. The release sheet of claim 16 wherein the catalyst is a platinum complex catalyst.
18. The release sheet of claim 16 wherein the nonionic surface wetting agent containing polyoxyethylene groups is a silicone glycol copolymer wetting agent.
- 15 19. The release sheet of claim 12 wherein the silicone release coating layer comprises 70 parts or less polyvinyl alcohol, 50 to 90 parts of a complex reactive organofunctional siloxane release modifier, 50 parts or less of a reactive organofunctional siloxane emulsion coating, and 4 to 8 parts of a silicone glycol copolymer wetting agent.
20. The release sheet of claim 1 or 12 wherein the dried coat weight of the acrylic functional coating
20 having a deep pattern for said surface effect is from 52 to 81 g/m².
21. The release sheet of claim 1 or 12 wherein the dried coat weight of the acrylic functional coating having a shallow pattern for said surface effect is from 37 to 52 g/m².
22. The release sheet of claim 1 or 12 wherein the dried coat weight of the silicone release coating layer is less than 3.7 g/m².

23. The release sheet of claim 12 having a surface effect with a high gloss wherein the silicone release coating layer comprises less than 45 parts polyvinyl alcohol and 50 to 80 parts of a complex reactive organofunctional siloxane release modifier.

24. The release sheet of claim 23 wherein the dried coat weight of the silicone release coating layer is from 1.5 to 3.7 g/m².

25. The release sheet of claim 12 having a surface effect with low gloss wherein the silicone release coating layer comprises 25 to 70 parts polyvinyl alcohol, 60 to 90 parts of a complex reactive organofunctional siloxane release modifier and 20 parts or less of a reactive organofunctional siloxane emulsion coating.

26. The release sheet of claim 25 wherein the dried coat weight of the silicone release coating layer is from 0.7 to 2.2 g/m².

27. A method of manufacturing a release sheet providing a desired surface effect for use in replicative casting of curable systems comprising:

- a) applying an acrylic functional coating layer to a substrate;
- b) pressing the coated side of the substrate against a replicative surface to cause the coating to conform with the replicative surface;
- c) curing the acrylic functional coating layer;
- d) stripping the cured coated substrate from the replicative surface;
- e) applying a silicone release coating layer on the acrylic functional coating layer; and
- f) curing the silicone release coating layer.

28. The method of claim 27 wherein the pressing step and the acrylic functional curing step are performed simultaneously.

29. The method of claim 27 wherein the acrylic functional curing step is achieved by radiation curing.

30. The method of claim 29 wherein the radiation curing is electron beam radiation curing.

31. The method of claim 27 wherein the silicone release coating applying step is performed by airbrush coating.
32. The method of claim 27 wherein the curing step for the silicone release coating maintains a minimum web temperature of 168 °C.